

# Semi maturation of bovine monocyte-derived dendritic cells after incubation with *Giardia duodenalis*

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*Giardia duodenalis* is an important intestinal parasite in animals and humans. The role of dendritic cells in the immune response against *G. duodenalis* is poorly documented and has only been studied in the mouse, which is not a natural host for this parasite. In this study we addressed the effect of *G. duodenalis* trophozoites and excretion/secretion (ES) products on the expression of maturation markers and cytokine production by bovine monocyte-derived dendritic cells (MoDCs) *in vitro*. Moreover, the ability of stimulated MoDCs to take up antigen and to induce mononuclear cell (MC) proliferation was assessed.

Although none of the maturation markers CD40, CD80 and MHCII were up-regulated in MoDC cultures after stimulation with *Giardia* trophozoites or ES, a dose-dependent decrease of ovalbumin uptake was observed. IL-15 transcription was significantly increased after 24h of stimulation with *Giardia* trophozoites. Other cytokines were not significantly up- or down-regulated. MoDCs stimulated with *Giardia* trophozoites or ES induced a dose-dependent proliferation of allogenic  $\gamma\delta$ -T-cells and TCR $\alpha\beta$ <sup>+</sup> CD4<sup>+</sup> and -CD8<sup>+</sup> T-cells *in vitro*, compared to cultures with unstimulated MoDCs. Induction of a CD4<sup>+</sup> T-cell response by *Giardia*-stimulated MoDCs was confirmed in an autologous lymphocyte proliferation assay, using MoDCs and PBMCs from calves artificially infected with *G. duodenalis* cysts.

Our data show that *G. duodenalis* trophozoites induce a functional maturation of bovine MoDCs. Functionally active MoDCs, lacking the expression of co-stimulatory molecules are known as semi-mature DC. Although semi-mature DC can cause T-cell tolerance, MoDCs stimulated with *G. duodenalis* showed a significantly increased mRNA transcription level of IL-15, which can explain the activation and proliferation of the T-cell populations despite the lack of co-stimulatory molecules present on the cell surface. Proliferating CD4<sup>+</sup> T-cells will be further characterised to investigate whether a regulatory T-cell response is induced by *Giardia*-stimulated MoDCs.

## Acknowledgements:

G.H. Grit is funded by a PhD grant from IWT-Vlaanderen.

S. Van Coppernolle is funded by the EU FP7 project (Paravac)

B. Devriendt is funded by a post-doc grant of Ghent University